

Report on Carcinogens Guided Search Help

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Functions

The Report on Carcinogens (RoC) provides information and evidences about chemical substances, biological substances, physical substances and circumstances that are known or reasonably anticipated to cause cancer in humans. The RoC is prepared by the National Toxicology Program (NTP) on a bi-yearly basis. The RoC application is a public interactive online tool that displays critical information from the report in a simple table format. Users have the option to search, browse, and download the data of interest. The RoC application provides direct access to the data to investigate associations between carcinogens and cancer/tumor types.

This tutorial details how to use the RoC application to:

1. Browse the full report including level of evidences for each carcinogen obtained from animal studies and/or human studies. User can also filter, sort, and download data of interest
2. Search the data for entries of interest with basic or advanced functions. Search criteria include subjects where evidences were identified (humans, animals or both) systems, organs/ tissues, and substance types in a Basic Search. Advanced Search options include cancer types (human), tumor types (animal),

other animal specific parameters (including route and species), and additional substance related parameters. Search results will be displayed in a table format

3. Download the full dataset including Animal Data; Human Data; and Substances Info. User can also download a search results table as an Excel file
4. Review Additional substance information on the Substance Profile, RoC Profile, NTP Supporting Documents and CEBS Test Article pages

To use the RoC application, select the “Reports on Carcinogens” link (<https://manticore.niehs.nih.gov/roc>) located on the CEBS Homepage (<https://manticore.niehs.nih.gov/cebssearch>). The user will be taken to the RoC basic search home page. From this page users can access the browse, search, and download options. The Navigation Bar located at the top of the page with ‘Report on Carcinogens’, ‘Advanced Search’ and ‘Help’ is available from all RoC application pages.

Browse

The Browse Data function is accessible by clicking on the <**BROWSE DATA**> button at the top of the homepage of the RoC application.

a) Browse Data

- Clicking the button opens the ‘Full Report on Carcinogens’ page containing all the entries from animal studies and human studies. There are 27 columns in the table. Nineteen columns contain information related to substances, pathology and study information in both human and animal studies. Three columns contain information relevant only to human studies. Five columns contain information relevant only to animal studies.
- Columns containing information related to substances, pathology and study information in both human and animal studies include:
 - **Substance CASRN**: Chemical Abstract Service Registry Number or other identifier associated with individual substances
 - **Substance**: Test article evaluated
 - **Substance Type**: General classification of the substance evaluated
 - **Substance Family**: Sub-classification of the substance evaluated
 - **Subject**: Human or animal
 - **System**: Biological system of the organ or tissue affected in study
 - **Organ or Tissue**: Organ or tissue affected in the study
 - **Post-RoC Information**: Additional study related information reported after the study
 - **Listing Status**: Indicates if the substance is either a known human carcinogen (Known) or is reasonably anticipated to be a human carcinogen (RAHC)
 - **Substance First Listing Edition**: Edition of the RoC that the substance was first published
 - **Substance First Listing Year**: Year of the RoC edition that the substance was first published
 - **Primary Substance Uses (CPCat, EPA)**: Primary applications of the substance as reported by the EPA’s Chemical and Product Categories database

- **Secondary Substance Uses (CPCat, EPA):** Secondary applications of the substance as reported by the EPA's Chemical and Product Categories database
- **Substance Uses (RoC):** Applications of the substance as reported by the RoC study
- **Substance Uses Restrictions (CPCat, EPA):** Restricted applications of the substance as reported by the EPA's Chemical and Product Categories database
- **Substance Uses Restrictions (RoC):** Restricted applications of the substance as reported by the RoC study
- **NTP Supporting Documents:** Links to the supporting data used to generate the RoC publication and application data
- **Notes:** Miscellaneous information regarding the study
- **CEBS Test Article Page:** Additional information from the Chemical Effects on Biological Systems (CEBS) website
- Columns relevant to human studies:
 - **Cancer Type (Human):** Classification of cancer
 - **Evidence Level (Human):** Level of evidence associated with a site specific cancer
 - **Overall Evidence Level (Human):** Level of evidence associated with cancer across all studies performed
- Columns relevant to animal studies:
 - **Tumor Type (Animal):** Classification of tumor
 - **Overall Evidence Level (Animal):** Level of evidence associated with causing tumor generation across all studies performed
 - **Species:** Species of animal
 - **Sex:** Sex of the animal
 - **Route:** Method the substance was administered (oral, injection, topical, etc.)

b) Browse Data Options

From the browse data page, the user has the following options:

- **Sort columns:** By clicking on the column header, the content is sorted in ascending or, by clicking a second time, descending order
Note: To sort on multiple columns hold the Shift key
- **Filter:** Type terms of interest into the 'Filter' box above the table to focus the displayed table on specific terms
- **Glossary:** Glossary of acronyms are defined at the bottom of the page. Hovering over an acronym within the table with the mouse pointer opens a window with the glossary term
- **Hide/Show Columns:** Click the <Hide/Show Columns> button to display an interactive list of columns headers. Switch buttons next to each header allow users to turn "off" (hide) or "on" (show) the columns:
 - Click the switch next to the column name to turn columns "on" or "off"
 - Click <Apply> to apply the changes
 - Click <Cancel> (or the <X> in the top right corner) to close the modal without affecting the table

- **DOWNLOAD TABLE and DOWNLOAD FULL DATASET:** Please see the [DOWNLOAD](#) section for information concerning these options.

Search

Basic searching is available from the homepage. More complex searching options are available using the Advanced Search option on the navigation bar.

a) Basic Search

The home page provides a basic search option based on the following fields. All fields allow the user to type-ahead to reduce/filter the number of available options displayed except 'Subjects'.

Note: Only one option can be chosen for each field. Click on the input box to see a drop-down list of options to select.

- **Subjects:** Option to select data for 'Animals and Humans' (default), 'Animals' or 'Humans'
- **Systems:** Subject-specific list of organ/tissue systems
- **Organs or Tissues:** Subject/System-specific list of organs or tissues
- **Substance Types:** Subject/System/Organ/Tissue-specific list of substance types with RoC data
- **Search:** Click the <Search> button to display the results of the criteria searched

b) Advanced Search

The advanced search provides the user with more criteria options to refine their search. It includes all human and animal fields as well as substance related fields. Click on 'Advanced Search' on the navigation menu at the top of the page to access to the Advanced Search functionality. Two search strategies, 'AND' and 'OR' are available. Both search strategies apply inside each field (e.g. in Systems: 'Cardiovascular' AND 'Endocrine' vs. 'Cardiovascular' OR 'Endocrine') as well as between fields (e.g.: 'Organ or Tissue: Bone' AND 'Routes (Animal): inhalation' vs. 'Organ or Tissue: Bone' OR 'Routes (Animal): inhalation'). A switch button next to "Include partial matches" allow users to turn "on" (include partial matches) or "off" (only show exact match) the partial matches function. All fields except 'Search Strategy', 'Subjects', and 'Additional Search Filters' allow the user to type-ahead to reduce/filter the number of available options displayed. These fields also allow the user to select multiple entries from the drop-down lists. Several search options are available. After all search options are chosen, clicking the <SEARCH> button will display the search results table that is organized by substance CASRN. Clicking the 'Clear' link to return all fields to their default settings.

- **Subjects:** The default selection for the 'Subjects' field is "Animals and Humans," so all human-related and animal-related fields are displayed. Changing 'Subjects' to "Animals" will change the available search options to animal-dependent only. If "Humans" is selected, then only the human-related fields will be available.
Note: changing the 'Subjects' field has no effect on substance-related fields
- **Systems:** This drop-down list is restricted based on Subjects/'Organs or Tissues' selected
- **Organs or Tissues:** This drop-down list is restricted based on Subjects/Systems selected

- **Cancer Types (Human):** This field is only visible when 'Humans' or 'Animals and Humans' is selected in the 'Subjects' field
- **Evidence Levels (Human):** This field is only visible when 'Humans' or 'Animals and Humans' is selected in the 'Subjects' field
- **Tumor Types (Animal):** This field is only visible when 'Animals' or 'Animals and Humans' is selected in the 'Subjects' field
- **Routes (Animal):** This field is only visible when 'Animals' or 'Animals and Humans' is selected in the 'Subjects' field
- **Sex (Animal):** This field is only visible when 'Animals' or 'Animals and Humans' is selected in the 'Subjects' field
- **Species (Animal):** This field is only visible when 'Animals' or 'Animals and Humans' is selected in the 'Subjects' field
- **+ SUBSTANCE FIELDS:** The fields available for this option are initially hidden when the page is loaded. Click the <+ SUBSTANCE FIELDS> button to display and search the substance-related fields. When expanded, the button's label changes to <- SUBSTANCE FIELDS>. Click the <- SUBSTANCE FIELDS> button to hide the fields. All substance fields have a drop-down menu of options that is revealed when clicking the empty search box.

Note: Selection in the any of the Substance Fields have no effect on 'Subjects' field.

The Substance Advanced search fields are:

- **Substance Type:** General classification of the substance evaluated
- **Substances:** Test article evaluated
- **Substance CASRN:** Chemical Abstract Service Registry Number or other identifier associated with individual substances
- **Substance Families:** Sub-classification of the substance evaluated
- **Listing Status:** Indicates if the substance is either a known human carcinogen (Known) or is reasonably anticipated to be a human carcinogen (RAHC)
- **First Listing Editions:** Edition of the RoC that the substance was first published
- **First Listing Years:** Year of the RoC edition that the substance was first published
- **Overall Evidence Level (Animal):** Level of evidence associated with causing tumor generation across all studies performed
- **Overall Evidence Level (Human):** Level of evidence associated with cancer across all studies performed
- **Additional Search Filters:** Includes only results with effects for the subject selected in the drop-down list. This option pre-filters the results of the selected search options to include results with (1) only human effects, (2) only animal effects, or (3) both human and animal effects.

c) Search Results Options

Basic Search and Advanced Search elicit results in the same format on the Search Results page. Results are reported in a table that is organized by substances. All functionalities described in the [Browse Data Options](#) section, are also active in the Search Result page, except for the Download Full Dataset option.

All Search Results pages (Basic or Advanced) have a 'Search Criteria' box at the top of the page. This box is populated with the user's current search criteria. Users can modify individual search criteria, or click the 'Clear' link to return all fields to their default settings.

Note: If search results are returned, the 'Search Criteria' box will be collapsed. Click the caret to the left of 'Search Criteria' to open the box.

Download

a) Download Full Dataset

Click the <**DOWNLOAD FULL DATASET**> button to download all the report data in a zip folder containing three Excel files: RoC_Animals_Data; RoC_Humans_Data; and RoC_Substances_Info. This functionality is available from the RoC Homepage and the Browse Data Page.

b) Download Table

The user can click the <**DOWNLOAD TABLE**> button to download the table as currently displayed (for example, if the user has chosen to only display specific columns, only those columns will be downloaded) in the format of an Excel file. This functionality is available on the Browse Data Page and on the Search Results pages.

Note: The downloaded table will include all results from the initial search (or browse data page), regardless if the 'Filter' box was used to focus the displayed table on specific terms.

Review

a) Substance Profiles

All of the substances in the RoC application have a Substance Profile page. The Substance Profile pages contain:

- Links to NTP profile and support documentation (if available)
- Metadata
- Listing information
- Substance uses (primary and secondary)
- Substance use restrictions
- Animal and human results tables for the substance

There are two ways to access the substance profiles.

- From the display table (resulting from a specific search or 'Browse Data' button): click the first link in the 'Substance' column
- From the downloaded table (Excel file): click the link in the 'Substance' column

b) RoC Profile

All of the substances in the RoC application have a link to the substance's listing in the RoC Publication in PDF format.

There are two ways to access the RoC profiles.

- From the display table (resulting from a specific search or 'Browse Data' button): click the RoC link (second link) in the 'Substance' column

- From the downloaded table (Excel file): click the link in the 'RoC Profile' column

c) NTP Supporting Documents

Some substances have one or more links to the supporting documents used to generate the RoC publication and application data. The supporting documents are in PDF format.

There are two ways to access the NTP Supporting Documents.

- From the display table (resulting from a specific search or 'Browse Data' button): click the 'Supporting Document' link(s) in the 'NTP Supporting Document' column
- From the downloaded table (Excel file): Copy and paste the link(s) in the 'NTP Supporting Document' column

d) CEBS Test Article Pages

Some substances have additional information in CEBS Test Article pages. These Test Article Pages can include the following information:

- Study results
- Study data
- Publications
- Citation information
- NTP data collections (if available)

There are two ways to access the CEBS Test Article pages.

- From the display table (resulting from a specific search or 'Browse Data' button): click the link(s) in the 'CEBS Test Article Page' column
- From the downloaded table (Excel file): Copy and paste the link(s) in the 'CEBS Test Article Page' column

Examples

Here are some examples of searches that can be performed using the Browse Data and Advanced Search features. Follow along with the steps in these examples to see the results of these searches in the application.

a) Browse Example

Find the entries associating N-Nitrosodimethylamine to any form of cancer and ignore the 'Post-RoC Information' and 'Notes'. View the results ordered by 'System', 'Organ and Tissue', and 'Tumor Type'

- 1) Click the **<BROWSE DATA>** button from the homepage
- 2) Click the **<Hide/Show Columns>** button and turn off 'Post-RoC Information' and 'Notes' fields
- 3) Click the **<APPLY>** button
- 4) Type "N-Nitrosodimethylamine" in the 'Filter' box
- 5) Holding the **<Shift>** button, click the 'System' field to sort contents in ascending order
- 6) Keep holding the **<Shift>** button and click on the 'Organ or Tissue' field to sort contents in ascending order
- 7) Keep holding the **<Shift>** button and click on the 'Cancer Type' field to sort contents in ascending order
- 8) Click the **<DOWNLOAD TABLE>** button to save the results table as an excel file

Note: If downloading the table while using the Browse feature, all entries will be included. However, “N-Nitrosodimethylamine” can be filtered in the downloaded Excel file if desired.

b) Search Example

Search for all the entries associating Asbestos to cancers in the Digestive/Gastrointestinal system that derive from studies in animal subjects without retrieving ‘Post-RoC Information’ and ‘Notes’. Results should be ordered by ‘Organ or Tissue’ and ‘Species’.

- 1) Click on the ‘Advanced Search’ link on the menu at the top of the homepage.
- 2) First select ‘Animals’ as ‘Subjects’ from the dropdown box.
- 3) Click in the ‘Systems’ box and select ‘Digestive/Gastrointestinal’ or type-ahead to reduce/filter the number of options displayed.
- 4) Click in the <+ **SUBSTANCE FIELDS**> button and select ‘Asbestos’ in the ‘Substances’ box or type-ahead to reduce/filter the number of options displayed.
- 5) Click on the <**SEARCH**> button at the bottom of the page.
Note: To change the searching parameters, click the ‘Clear’ link to return all fields to their default settings
- 6) Click the <**Hide/Show Columns**> button and turn off ‘Post-RoC Information’ and ‘Notes’ fields
- 7) Click the <**APPLY**> button
- 8) Holding the <**Shift**> button, click the ‘Organ or Tissue’ field to sort contents in ascending order
- 9) Keep holding the <**Shift**> button and click on the ‘Species’ field to sort contents in ascending order
- 10) Click the <**DOWNLOAD TABLE**> button to save the results table to an Excel file

Additional Instructions/Information

- CEBS data may be cited by navigating to the CEBS Support page, and selecting [the Citing CEBS](#) document under FAQs
- Please contact CEBS-Support@mail.nih.gov for additional assistance